Notes for Remarks

by

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to the

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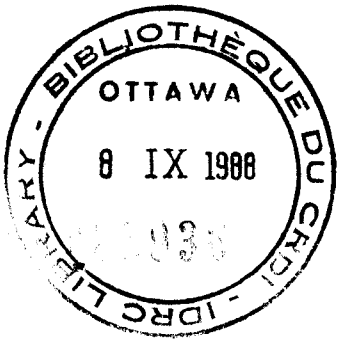

Mr. Chancellor, Mr. President, Mrs. Fowler, Mr. Robinson, Members of the Faculty, Ladies and Gentlemen, fellow members of the 1988 graduating class:

I'm most grateful for this honour, and I thank you, sincerely, Dr. Fyfe, for the generous citation. Your references to IDRC are particularly appreciated.

Edmontonians, Mr. Chancellor, know well the quality of this University and this city; neither the Eskimos nor the Oilers would have been the same without you. I'm proud to be associated with that chain of friendship which features such strong links as Don Getty and Craig Simpson. In the words of fellow Albertan, k.d. lang: "I'm tickled pink."

What can an Albertan say to this distinguished audience of young scientists, Mr. Chancellor? That because the Grey Cup and the Stanley Cup are both in Edmonton where they belong, the universe is unfolding as it should? That all will be harmonious in a Canadian federal system where two of the ten premiers are products of Western? Or, perhaps most important, that this great university is on course towards a dazzling future under the leadership of its Alberta-born President?

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Those observations are all self-evident. The next one is less so. So hold on to your mortar boards as I tell you that the degrees that you are about to receive will, I fervently hope, make each of you aware of your latent schizophrenia. How so? Let me explain.

As graduates in the science disciplines, you are joining today a proud community; you do so at a time when society has placed unrealistically high expectations upon scientists. You and your colleagues elsewhere will be called upon to interpret to the rest of us any number of puzzling natural phenomena, unmask the secrets which block the prevention and cure of devastating illnesses, provide the bases for cunningly useful technological devices, point the way to a future for all of us that will be environmentally wholesome, personally healthy, and economically fulfilling. In one of history's great ironies, your education gives you an immense head start towards all of those accomplishments, yet does so at a time when the future condition of this planet's biosphere, and the welfare - even the survival - of the human species is in greater jeopardy than ever before. In what must be one of life's most pointed contradictions, many of the perils that you are expected to overcome are sourced in the laboratories of your scientific elders - those brilliant practitioners who unlocked the secrets

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of the atom, who deciphered the DNA code, who created new families of toxic chemical compounds. An even more worrisome contradiction is the likelihood that the future efforts of some of you may contribute to new perils and so lead to the same kind of paradox.

What to do? Here comes the schizophrenia.

When you entered this auditorium earlier this afternoon many of you were accompanied by members of your family, your most immediate links with the larger human community. When you leave here a couple of hours from now you will be proud graduates in the science disciplines, but you will still retain membership in that family. Your immediate relatives will look to you with increased respect - and properly so. Each of you will carry with you a treasured certificate. But you will still be daughter or son, sister or brother, mother or father. The degree that you will then possess won't diminish that relationship one whit; it will, however, place added responsibility upon it. You must, I beg you, not separate your two roles, not submit to schizophrenic tendencies. Your humanitarian instincts must accompany you as you enter and leave your laboratories. That may prove to be more difficult than you think.

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In those far distant days when classical languages were deemed an essential ingredient in the educational process, university students routinely became acquainted with Latin and Greek. Two English words, which I urge you always hereafter to link together, come respectively from Latin and Greek roots. The first, from Latin, is 'science', meaning 'to know or to decide'. The second, from Greek, is 'ethics', meaning 'character'. Over the years, society has contributed to its own decay by fostering the impression that ethics as an obligation rests primarily, if not exclusively, on a handful of professions - lawyers, doctors, the clergy - and seemingly even then only in the present tense and in the intimacy of one's immediate surroundings. In these final days of the 20th century, if any of you believe in that narrow interpretation you are, in k.d. lang's words, "hooked on junk".

Today, with an immediacy and a gravity unknown to any previous generation, a powerful ethic must penetrate every profession and every discipline. A human ethic. An ethic of global dimensions - of human decency, of human wholesomeness, of human survival. Twenty-five centuries ago, Hippocrates prescribed to physicians a variant of that ethic. Today, a form of the Hippocratic oath should be made mandatory for all who have been given the priceless gift of higher education, an oath

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containing Hippocrates' words "never do harm to anyone." In that phrase science and ethics coincide. As they coincided in Albert Einstein's courageous but futile endeavours to warn governments of the perils of nuclear armaments. As they do now in the activities of Dr. John Polanyi whose reputation is rooted in his laboratory accomplishments, but whose public statements and actions resonate with his concern for the human condition. History measures Einstein and Polanyi on this broader scale. So will each of you be measured. So must each of you measure yourselves.

Your recently acquired knowledge - incomparably greater than the information available to any previous generation - will not always be susceptible of wholesome application. In certain instances it may cause irreparable harm. As has happened often. In such circumstances, the involvement of the scientist is lucid no matter how tenuous the link. It can be traced through the maze of inadequately labelled pesticides, pharmaceuticals or milk substitutes that are distributed to illiterate communities in developing countries; it can be found in the compounds and the gadgetry that assault the integrity of our ecosystems. It is evident in one of life's cruelest ironies, the grotesque fact that one out of every four

scientists and technologists in the entire world engaged in R and D is working on weapons. Not food production. Not disease control. Not environmental protection. Weapons.

Ethical issues are often elusive and are always difficult to resolve. Nor are they always associated with the supply of something. They arise, too, in instances of denial.

One form of this latter is of much more recent origin. It is a novel and perplexing challenge of our age: the issue of access to knowledge, of openness of scientific pursuit. The social nature of science, the broad community of scholarship, the shared sense of benefit - these are all now the subject of debate as the cost of scientific research soars, as the profits from technological achievement beckon, as proprietary interests seek protection and advantage. In this environment, the old academic adage of "publish or perish" takes on a new meaning - one that strikes with particular cruelty at the developing countries. The likelihood that these countries will overcome the crippling poverty that grips them depends in important measure on their ability to utilize science and technology. In the 20th century, that presumes access to knowledge.

From the darkness of prehistory until this moment, technology has been the single most powerful change agent known to humankind. Yet the nature of technology has changed immeasurably over the years, and dramatically so recently. No longer - as in the bronze age - does technology precede science; no longer - as in the industrial revolution or the early days of this century -do scientists find themselves perfecting and explaining devices cobbled together by brilliant inventors. Today's technologies are science-based and science-driven. The knowledge building blocks for biotechnologies, solid state electronic devices, and marvelous chemical compounds first came forward in the labs of highly educated scientists, not in the workshops of clever craftsmen. Because we live in an information age the new knowledge can be employed faster than ever before; sometimes with inadequate reflection on its wise applications; all too often with constraints on its transfer to the developing countries, thus widening still further the gap in living standards between North and South, and intensifying the impoverishment that the Brundtland Commission has identified as the principal menace to the human environment.

The 20th century combination of brilliant scientific discoveries, ingenious technological applications, and transnational business organizations, has transformed human

beings into planetary actors. We accept without a second thought the conveyance of ABBA from Stockholm to Jakarta, blue jeans from Winnipeg to Moscow, VCRs from Tokyo to Buenos Aires. Even the MacKenzie Brothers from somewhere to somewhere else. Yet the acceleration of scientific discovery and technological implementation has left society's monitoring and control mechanisms far behind. Whether at the national or international level, governance techniques are all too often inadequate, inappropriate or inapplicable. And all the while environmental degradation increases, nuclear and other munitions become more miniaturized, and massive monetary transactions are made instantaneous by sophisticated electronic communications systems. This pace of science, technology and communications is beyond the present experience of government to handle, which adds to your responsibilities.

Be in no doubt: the innovations which will be produced by you and your generation will reach far beyond your laboratories. They will bear upon our democratic freedoms, our economic opportunities, our planetary health. The wise and humane application of those innovations depends upon each of you as scientists every bit as much as upon those of us who are not. But you have the advantage, and I urge you to use it. Your scientific education is of immense benefit. Within each of you

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is a respect for methodological discipline and, of equal importance, an insatiable inquisitiveness. This combination you must wisely employ and generously share. Your scientific insights, coupled with your human wisdom, must be passed on to others both North and South, not excluding those who seek political office.

You can demonstrate to those persons that ignorance is no disgrace, but indifference is; that curiosity is not a negative, arrogance is; that ethical challenges are not easy but their avoidance is indefensible. If you resist your schizophrenic tendencies, and dedicate yourself to the pursuit of new knowledge equally as you resist its inhumane application, you will be agents of positive change, contributors to a wholesome future for all, in all parts of the world. Non-scientists everywhere count on you to do that.

Before I resume my seat, may I mention one other Albertan, Mr. Chancellor? Not this time an athlete or a politician or a recording artist. Not a scientist either. Instead a person who demonstrated to this university the richness of the human community. In whose debt we all are. Wesanne Anderson McKellar approached life holistically, the way I am confident all of you will.

Good luck classmates. I'm proud to be one of you.